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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/555,657

11/04/2005

Tsumoru Ohata

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EXAMINER

LEE, CYNTHIA K

ART UNIT

PAPER NUMBER

1795

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/555,657	<b>Applicant(s)</b> OHATA ET AL.	
	<b>Examiner</b> CYNTHIA LEE	<b>Art Unit</b> 1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 18 June 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1,4-9,16-22 and 25 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,4-9,16-22 and 25 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                       | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>4/03/08,6/20/08</u> .   | 6) <input type="checkbox"/> Other: _____                          |

### ***Response to Amendment***

This Office Action is responsive to the amendment filed 6/18/2008. Claims 10-15 have been canceled. Claims 1, 4-9, 16-23 and 25 are pending.

Claims 1, 4-9, 16-20, 21, 22, and 25 are finally rejected for reasons stated herein below.

### ***Information Disclosure Statement***

The Information Disclosure Statement (IDS) filed 4/3/2008 and 6/20/2008 have been placed in the application file and the information referred to therein has been considered.

### ***Claims Analysis***

To avoid 35 USC 112, 2<sup>nd</sup> paragraph issues, the limitation “indefinite-shape particle” has been defined as “shapes having knots, bumps, or bulges based on the primary particles, that is, for example, shapes like dendrite, grape clusters, or coral, unlike shapes that are spherical or egg-shaped, or that are similar to such shapes” as supported by the Specification pg 5 paragraph [0009].

### ***Claim Rejections - 35 USC § 102/103***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

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The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 4-6, 8, 9, 21, 22 are rejected 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Koike (JP 07-220759).

Koike discloses a secondary battery comprising a positive electrode, a negative electrode, a coating film (applicant's porous electron-insulating layer) adhered to the anode (see working example 2). A separator is present comprising a fine porous film. The coating comprises a slurry of alumina powder and PVdF mixed in n-methyl pyrrolidone.

Koike does not expressly disclose that the slurry comprises indefinite shape particles comprising dendrites, grape clusters, or coral. Although Fig. 1 and 2 of Koike discloses spherical particles aligned, the Examiner notes that they are merely illustrative and not drawn to scale. Because of the presence of the binder (PVdF), the alumina particles mixed with PVdF will naturally (or inherently) form indefinite shapes, such as dendrites, grape clusters, or coral.

Regarding the limitation "said particulate filler substantially comprises an indefinite-shape particle which has the shape of dendrites, grape clusters, or coral, said shape having a neck" in claim 1 and the particle dimensions of claim 4, it is noted that the primary particles are not present as distinct particles in the final product. It is further noted that Koike's particles are naturally not a perfect sphere. Thus,

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bumps/irregularities on a single particle are interpreted as the “primary particles” and the portions in between the irregularities within a single particle are interpreted as “a neck portion”.

Regarding claim 4 and 12, Koike discloses that the particle size of the fine particles is between 0.1  $\mu\text{m}$  to 50  $\mu\text{m}$ , preferably from 5  $\mu\text{m}$  to 10  $\mu\text{m}$  [0030]. Thus, “the primary particle” would not be more than 10  $\mu\text{m}$ .

Claims 1, 4-6, 9, 21, 22 are rejected 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Delnik (US 5948464).

Delnik discloses a secondary battery comprising a positive electrode, a negative electrode, a separator (applicant’s porous electron-insulating layer) adhered to the anode and cathode. See fig 1. A separator is present comprising a fine porous film. The precursor separator solution comprises silica filler and a polymer binder (see Abstract). The separator comprises indefinite-shape particles comprising shapes of dendrites, grape clusters, or coral. See Fig. 2.

Regarding the limitation “said particulate filler substantially comprises an indefinite-shape particle which has the shape of dendrites, grape clusters, or coral, said shape having a neck” in claim 1 and the particle dimensions of claim 4, it is noted that the primary particles are not present as distinct particles in the final product. It is further noted that Koike’s particles are naturally not a perfect sphere. Thus,

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bumps/irregularities on a single particle are interpreted as the “primary particles” and the portions in between the irregularities within a single particle are interpreted as “a neck portion”.

Regarding claim 4 and 12, Koike discloses that the particle size of the fine particles is between 0.1  $\mu\text{m}$  to 50  $\mu\text{m}$ , preferably from 5  $\mu\text{m}$  to 10  $\mu\text{m}$  [0030]. Thus, “the primary particle” would not be more than 10  $\mu\text{m}$ .

Claims 16-20 and 25 are rejected 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Delnik (US 5948464), as evidenced by Walls, et. al., (Fumed silica-based composite polymer electrolytes: synthesis, rheology, and electrochemistry, Journal of Power Sources 89 (2000) 156-162).

Delnik discloses a secondary battery comprising a positive electrode, a negative electrode, a separator (applicant's porous electron-insulating layer) adhered to the anode and cathode. See fig 1. A separator is present comprising a fine porous film. The precursor separator solution comprises silica filler and a polymer binder (see Abstract). The separator comprises indefinite-shape particles comprising shapes of dendrites, grape clusters, or coral. See Fig. 2.

Regarding claim 16 “a neck is formed between at least a pair of said single crystalline particles, said neck comprising the same material as said single crystalline particles”, Delnick discloses of using fumed silica (Delnick's claim 5). It is noted that fumed silica consists of fused silica particles. See Walls, pgs 156.

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Regarding claim 17, Koike discloses that the particle size of the fine particles is between 0.1 um to 50 um, preferably from 5 um to 10 um [0030]. Thus, “the primary particle” would not be more than 10 um.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 4, 8, 9 are rejected under 35 U.S.C. 103(a) as obvious over Takata (US 6638988).

Takata discloses a secondary battery comprising a positive electrode, a negative electrode, a separator (applicant's porous electron-insulating layer) adhered to the anode and cathode (6:55-7:15). A separator is present comprising a porous film. The separator is made of hydrotalcite and polypropylene resin and the mixture is kneaded by a biaxial kneader. See Example 1.

Takata does not disclose indefinite shape particles. However, Takata discloses of using organic fillers. See 3:55-60 for the particular organic fillers. It would have been obvious to one of ordinary skill in the art at the time the invention was made to substitute hydrotalcite for Takata's organic filler because Takata teaches that either organic fillers or inorganic fillers can be used as binders (3:40-45). It is noted that when

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a mixture of organic fillers and a resin binder are kneaded in a kneader, the organic filler particles will naturally aggregate and form indefinite-shape particles comprising shapes of dendrites, grape clusters, or coral.

Regarding Applicant's claim 4, Takata discloses that the average particle size of the filler is not more than about 1  $\mu\text{m}$  (59-65).

Regarding the limitation "said particulate filler substantially comprises an indefinite-shape particle which has the shape of dendrites, grape clusters, or coral, said shape having a neck" in claim 1 and the particle dimensions of claim 4, it is noted that the primary particles are not present as distinct particles in the final product. It is further noted that Takata's particles are naturally not a perfect sphere. Thus, bumps/irregularities on a single particle are interpreted as the "primary particles" and the portions in between the irregularities within a single particle are interpreted as "a neck portion".

Another interpretation of claim 1 is that the claim does not specify to what extent the particles are bonded. According to the process, a plurality of primary particles completely fused together would form one large particle. Thus, it is noted that each fine particle of Takata aggregates to form indefinite shape particles and reads on the product made by the process because primary particles do not exist in the final product.

Once the examiner provides a rationale tending to show that the claimed product appears to be the same or similar to that of the prior art, although produced by a different process, the burden shifts to applicant to come forward with evidence establishing an unobvious difference between the claimed product and the prior art



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product. In re Marosi, 710 F.2d 798, 802, 218 USPQ 289, 292 (Fed. Cir. 1983) The Applicants are also advised to provide evidence as to why the modified separator of Takata with the organic filler does not read on the instant set of claims.

Claims 7 and 20 are rejected under 35 U.S.C. 103(a) as obvious over Koike (JP 07-220759) as applied to claims 1 and 16, in view of Waterhouse (US 4363856).

Koike discloses all the elements of claims 1 and 16 and are incorporated herein. Koike does not disclose that the resin binder comprises a polyacrylic acid derivative. Koike discloses that the resin comprises PVdF resin. However, Waterhouse teaches of using acrylic acid as a binder for the separator (3:35). It would have been obvious to one of ordinary skill in the art at the time the invention was made to substitute acrylic acid of Waterhouse for Koike's PVdF resin because it has been held by the court that the selection of a known material based on its suitability for its intended use is *prima facie* obvious. Sinclair & Carroll Co. v. Interchemical Corp., 325 U.S. 327, 65 USPQ 297 (1945). See MPEP 2144.07.

Claims 7 and 20 are rejected under 35 U.S.C. 103(a) as obvious over Delnik (US 5948464) as applied to claims 1 and 16, in view of Waterhouse (US 4363856).

Delnik discloses all the elements of claims 1 and 16 and are incorporated herein. Delnik does not disclose that the resin binder comprises a polyacrylic acid derivative. Delnik discloses that the resin comprises PVC, PVdF, and EPDM resin (7:5-15).

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However, Waterhouse teaches of using acrylic acid as a binder for the separator (3:35). It would have been obvious to one of ordinary skill in the art at the time the invention was made to substitute acrylic acid of Waterhouse for Delnik's resin because it has been held by the court that the selection of a known material based on its suitability for its intended use is *prima facie* obvious. *Sinclair & Carroll Co. v. Interchemical Corp.*, 325 U.S. 327, 65 USPQ 297 (1945). See MPEP 2144.07.

Claim 7 is rejected under 35 U.S.C. 103(a) as obvious over Takata (US 6638988) as applied to claim 1 in view of Waterhouse (US 4363856).

Takata discloses all the elements of claim 1 and are incorporated herein. Takata does not disclose that the resin binder comprises a polyacrylic acid derivative. Takata discloses that the resin comprises a polyolefin (4:45). However, Waterhouse teaches of using acrylic acid as a binder for the separator (3:35). It would have been obvious to one of ordinary skill in the art at the time the invention was made to substitute acrylic acid of Waterhouse for Takata's resin because it has been held by the court that the selection of a known material based on its suitability for its intended use is *prima facie* obvious. *Sinclair & Carroll Co. v. Interchemical Corp.*, 325 U.S. 327, 65 USPQ 297 (1945). See MPEP 2144.07.

### ***Response to Arguments***

Applicant's arguments filed 6/18/2008 have been fully considered and only the relevant arguments will be addressed herein below:

Applicant's arguments with respect to Takata have been considered but are moot in view of the Examiner's new position.

New interpretation of claims 16-20 and 25 have been applied in view of Delnick.

37 CFR 1.111(b) states, "A general allegation that the claims define a patentable invention without specifically pointing out how the language of the claims patentably distinguishes them from the references does not comply with the requirements of the section." Applicant has failed to specifically point out how the language of claim 1 patentably distinguishes them from the references.

Applicant must discuss the references applied against the claims, explaining how the claims avoid the references or distinguish from them.

### ***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the

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shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Cynthia Lee whose telephone number is 571-272-8699. The examiner can normally be reached on Monday-Friday 8:30am-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Cynthia Lee/  
Examiner, Art Unit 1795

/PATRICK RYAN/  
Supervisory Patent Examiner, Art  
Unit 1795

ckl

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Cynthia Lee